

Knowledge Organiser – 8.4 Digestion

There are 7 different types of nutrients;

1. Carbohydrates; simple carbohydrates provide a quick source of energy. Complex carbohydrates release energy more slowly.
2. Lipids (fats and oils)
3. Proteins
4. Vitamins
5. Minerals
6. Water (needed in all cells and body fluids)
7. Dietary fibre

Food Tests

A food solution must be prepared by crushing the food and then adding a few drops of distilled water.

- **Starch** → If iodine is added to starch it will turn blue/black.
- **Sugar** → If Benedict's solution is added to a sugar and heated it will form an orange-red precipitate.
- **Lipids** → To test for fat, mix the substance with a small amount of ethanol and distilled water, if a milky white emulsion appears, then fat is present OR rub solid food into a piece of filter paper, if the paper turns translucent the food contains lipids.
- **Protein** → If Biuret solution is added to protein it will turn purple.

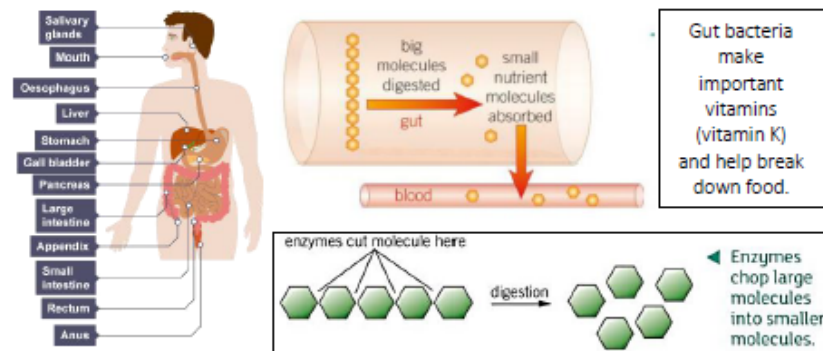
UNHEALTHY DIET

- Energy in food is measure in joules or kilojoules (1 kilojoule = 1000 joules).
- The amount of energy you need depends on your age, body size, gender and fitness.
- If energy in food is less than the energy you use, you will lose body mass (become underweight). Underweight people suffer from health problems, lack energy and are likely to have mineral deficiencies.
- Overweight people have an increased risk of heart disease, stroke, diabetes and some cancers.
- Vitamin and mineral deficiencies can damage a person's health; vitamin D deficiency can lead to weak bones (rickets).

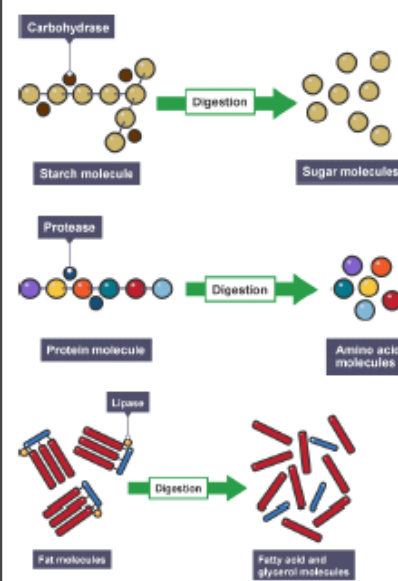
DIGESTIVE SYSTEM

Mouth	Food is chewed and mixed with saliva. Teeth help to break the food into smaller chunks.
Gullet	Food passes down this tube.
Stomach	Food is mixed with digestive juices and acids.
Small intestine	Digestive juices from the liver and pancreas are added and digestion is completed. Small molecules of nutrients pass through the intestine wall into the bloodstream.
Large intestine	Only food that cannot be digested gets this far. Water passes back into the body, leaving a solid waste of undigested food called faeces.
Rectum	Faeces are stored here until they leave the body.
Anus	This is a muscular ring through which faeces pass out of the body.

The small intestine has a thin wall, covered in villi. These structures increase the surface area for absorption. They also contain blood capillaries to carry away absorbed food molecules.



DIFFERENT TYPES OF ENZYMES; different enzymes break down different nutrients.



Carbohydrates are digested in the mouth (saliva), stomach and small intestine.

Proteins are digested in the stomach and small intestine. Acid in the stomach helps digestion and kills harmful microorganisms.

Lipids are digested in the small intestine. It is helped by bile (a substance made in the liver).

KEYWORD	DEFINITION
Balanced diet	Eating food containing the right nutrients in the correct amounts.
Bile	Substance that breaks fat into small droplets.
Carbohydrase	Enzyme that breaks down carbohydrates into sugar molecules.
Carbohydrates	Nutrients that provide the body's main source of energy. There are two types; simple (sugars) and complex (starch).
Deficiency	A lack of minerals that causes poor growth.
Dietary fibre	Parts of plants and animals that cannot be digested. It helps the body to eliminate waste by providing bulk to keep food moving through the digestive system.
Digestion	Process in which large molecules are broken down into small molecules.
Digestive system	Group of organs that work together to break down food.
Enzymes	Substances that speed up the chemical reactions (biological catalysts) of digestion resulting in large molecules being broken into small molecules.
Food tests	Chemical test to detect the presence of particular nutrients in food.
Gut bacteria	Microorganisms that naturally live in the intestine and help food break down.
Lipase	Enzyme that breaks down lipids into fatty acids and glycerol.
Lipids	Nutrients that provide a store of energy and insulate the body. Sources are butter, milk, nuts.
Minerals	Essential nutrients needed in small amounts to keep you healthy. Sources are fruit and vegetables.
Nutrients	Essential substance that your body needs to survive, provided by food.
Obese	Extremely overweight.
Protease	Enzyme that breaks down protein into amino acids.
Proteins	Nutrient your body uses to build new tissue for growth and repair. Sources are meat, fish, eggs.
Starvation	Extreme case of not eating enough food.
Vitamins	Essential nutrients needed in small amounts to keep you healthy. Sources are fruit and vegetables.